

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TENNESSEE
AT KNOXVILLE

GREG ADKISSON, et al.,)	
Plaintiffs,)	
v.	)	No. 3:13-CV-505-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.	)	<i>Lead case consolidated with</i>
)	
KEVIN THOMPSON, et al.,)	
Plaintiffs,)	
v.	)	No. 3:13-CV-666-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.	)	<i>as consolidated with</i>
)	
JOE CUNNINGHAM, et al.,)	
Plaintiffs,)	
v.	)	No. 3:14-CV-20-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
)	
BILL ROSE,)	
Plaintiff,)	
v.	)	No. 3:15-CV-17-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
)	
CRAIG WILKINSON, et al.,)	
Plaintiffs,)	
v.	)	No.: 3:15-CV-274-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
)	
ANGIE SHELTON, as wife and next of kin)	
on behalf of Mike Shelton, et al.,)	
Plaintiffs,)	
v.	)	No.: 3:15-CV-420-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
)	
JOHNNY CHURCH,)	
Plaintiff,)	
v.	)	No.: 3:15-CV-460-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	

DONALD R. VANGUILDER, JR.,)	
Plaintiff,)	
v.	)	No. 3:15-CV-462-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
<hr/>		
JUDY IVENS, as sister and next of kin,)	
on behalf of JEAN NANCE, deceased,)	
Plaintiff,)	
v.	)	No. 3:16-CV-00635-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
<hr/>		
PAUL RANDY FARROW,)	
Plaintiff,)	
v.	)	No. 3:16-CV-00636-TAV-HBG
JACOBS ENGINEERING GROUP, INC.,)	
Defendant.)	
<hr/>		

**JACOBS ENGINEERING GROUP, INC.’S SUPPLEMENTAL BRIEF
ADDRESSING THE ISSUE OF GENERAL CAUSATION**

Jacobs Engineering Group, Inc. (“Jacobs”) respectfully submits this brief pursuant to the Court’s August 28, 2018 Order, in which the Court ordered the parties to further address whether “exposure to the Kingston coal ash or fly ash is capable of causing the complained-of ailments,” (*i.e.*, general causation). [Doc. 293, at 2.] In that Order, the Court has correctly honed in on two related issues that are dispositive in these cases as to the issue of general causation, namely the issues of biological plausibility and bioavailability.

INTRODUCTION AND SUMMARY OF ARGUMENT

There is a substantial gap in Plaintiffs’ proof regarding the possible health effects of exposure to fly ash. Dr. Paul Terry, Plaintiffs’ expert, has conducted a literature review that addresses the associations found in certain studies between some of the *constituents* of fly ash and certain health conditions; however, he does not address general causation as to exposure to *fly ash*

and, in particular, does not address whether it is biologically plausible that Plaintiffs' exposure to fly ash (as opposed to constituents found in fly ash) could have caused their injuries.

Dr. Terry concedes that there is no study involving fly ash exposure that establishes any association between fly ash exposure and any health condition, and that he has not personally conducted any such analysis. Terry Dep., at 188:7 to 188:17; 192:8-192:20. He does not address the minimum levels or doses of fly ash exposure that would be sufficient to cause any condition, or whether it would have been possible for a worker to be exposed to such a dose of fly ash at Kingston. Indeed, Dr. Terry admits he has no knowledge regarding the exposures at issue in these cases, although he asked for (and has conceded the importance of) such data. Terry Dep., at 77:3-79:9; 86:15-86:21; 88:19-89:21. Thus, he cannot make any comparison between levels/types of exposures that were possible at Kingston and the exposures addressed in the studies that he cites.

Critically, Dr. Terry has also expressly conceded that he cannot establish that it is biologically plausible¹ that an exposure to *fly ash* was capable of causing any injury. Terry Dep., at 137:25 to 139:19. Dr. Terry intended to address that very issue through his prior study, but the study was abandoned. Terry Dep., at 139:15 to 139:19. Absent any data regarding the incidences of the conditions at issue amongst the Plaintiffs or any other group exposed to fly ash, Dr. Terry has acknowledged that there is no way to address biological plausibility as to fly ash exposure. *Id.* at 137:25 to 139:19. Even if such data were available, Dr. Terry would still not be able to establish biological plausibility as to fly ash exposure, because he has no way to explain *how* such particles

¹ Biological plausibility is one of the Bradford Hill Principles, also known as "Criteria." [Doc. 253-4, at 4.] Dr. Terry states that biological plausibility is one of the five "most common[]" criteria used to evaluate whether exposure to a particular substance is capable of causing a particular injury, and agreed in his deposition that it is *necessary* to establish biological plausibility in order to establish general causation. Terry Dep., at 178:16 to 179:2 (agreeing that for "each and every grouping" identified in his report, he "necessarily checked off the biological plausibility box.").

are capable of causing harm. As his report illustrates, in order to address biological plausibility, he must first determine *how* the substance is capable of reacting or interacting with the body so as to cause the particular condition. [See Doc. 253-4 (describing “biological mechanisms”).] Dr. Terry does not offer *any* opinion addressing what happens to *fly ash particles* once in the body.

Instead, Dr. Terry has addressed what happens after certain *constituents* have *already been absorbed* by the body. However, the undisputed proof in the record is that most of the constituents identified – the heavy metals² – were not bioavailable through an exposure to fly ash, *i.e.*, an exposure to fly ash did *not* “equate[] to an exposure to the potentially toxic constituents bound up in the ash.” See *In re TVA Ash Spill Litig.*, 805 F. Supp. 2d 468, 482 (E.D. Tenn. 2011); [Docs. 192-11, at xix, 20, 79; 192-12, at 247-48; 237-7, at 10, 12, 13; 237-13, at 2.]. Dr. Terry does not dispute that fact, Terry Dep., at 192:8-192:20, and does not offer any opinion explaining how the constituents could have become unbound either in the environment or through exposure. Having failed to address those issues, Dr. Terry cannot establish that it is biologically plausible that Plaintiffs’ exposure to heavy metal constituents in fly ash was capable of causing the injuries alleged. Similarly, because Dr. Terry cannot explain what happens to fly ash particles once they enter the body, and *how* such particles can cause harm, Dr. Terry cannot explain how “fine particulate matter” (which are simply fly ash particles of a certain size)³ or ionizing radiation plausibly could have caused any of the medical conditions at issue.

² As discussed below, in addition to heavy metal constituents, Dr. Terry has identified associations involving fine particulate matter and ionizing radiation. Dr. Terry has also failed to establish that those “components” were capable of causing the alleged injuries, for the reasons stated, *infra*.

³ In particular, Dr. Terry can neither explain what characteristics of fine particulate matter found in fly ash might have caused any harm (he does not know the shape of the particles), nor distinguish between exposure to fine particulate matter from fly ash and an exposure to dust particles of a similar size from other sources. Terry Dep., at 129:15-131:6; 144:6-146:9.

For all of these reasons, which are further discussed below, Plaintiffs cannot prove general causation, and the pending Motion should be granted.

SUMMARY OF RELEVANT EVIDENCE

A. Opinions Disclosed by Dr. Paul Terry

1. All of the opinions in Dr. Terry's prior reports have been withdrawn.

As an initial matter, Dr. Terry has provided, in his newest report, a "literature review" that is entirely separate from any of the work that he previously performed in these cases. Dr. Terry has confirmed that he is not relying upon any of the work that was performed in furtherance of his abandoned epidemiological study, and that he has withdrawn all of his previously disclosed opinions. Terry Dep., at 109:9-110:4; 139:15-139:19.⁴

2. The opinions in Dr. Terry's third report do not address exposure to *fly ash*.

Dr. Terry states that he was asked by Plaintiffs' counsel to analyze the "illnesses and physical conditions associated with exposure to coal ash" [Doc. 253-4, at 5-6], but none of his

⁴ Notably, Dr. Terry previously stated under penalty of perjury in his October Disclosure that he had not been able to complete his prior study because he had "intended to rely heavily upon" the air monitoring data for the Kingston site, but was unable to use that data because it was "[his] information . . . that the air monitoring data was altered, destroyed or otherwise rendered unreliable." [Doc. 205-06, at 1.] However, Dr. Terry testified in his deposition that, consistent with the explanation provided in his third report, the true reason that he was not able to complete his planned epidemiological study was that Plaintiffs' attorneys had not been able to provide sufficient responses from his planned control group. Terry Dep., at 64:9-68:21; 76:12-76:14. Dr. Terry further confirmed that he has *never* been provided a copy of the air monitoring data from Kingston, despite multiple requests to Plaintiffs' counsel. *Id.* at 77:3-79:9; 86:15-86:21; 88:19-89:21.] His only basis for the assumption that the data was unreliable was that Plaintiffs' counsel had told him that information verbally. *Id.* at 84:14-85:5. Dr. Terry admitted that the referenced statement in his Declaration, in which he blamed his inability to complete his study on the supposed revelation about the air monitoring data, was false. *Id.* at 85:6-86:11. Dr. Terry further testified that he did not actually draft the October Declaration; it was provided to him by counsel. *Id.* at 59:5 to 61:6. Critically, Dr. Terry did not dispute in his deposition that he believed that air monitoring results, if valid, would be important to the issue of general causation in these cases. *Id.* at 88:19-89:21.

opinions actually address exposure to *fly ash*. Instead, Dr. Terry’s opinions address associations that have been identified between exposure to certain *constituents* found in fly ash and certain health conditions.⁵ Thus, while Dr. Terry refers to substances “in coal ash” (e.g., lead *in coal ash*, arsenic *in coal ash*, etc.), his report reflects (and his testimony confirms) that his opinions solely relate to the “components” of fly ash. [See *id.*, at 13 (Report, at 5) (“As reflected in the remainder of this report . . . diseases found among one or more plaintiffs were determined by general causation analyses to be causally associated with one or more of *these components* of coal fly ash – that is, *these components* of coal fly ash can cause these diseases.”) (emphasis added).]

Critically, Dr. Terry does not make any attempt to connect his opinions addressing exposures to the constituents found in fly ash and an exposure to *fly ash*. Most notably, he has conceded that he is not aware of *any* study involving fly ash in which the author(s) concluded that there was *any* association between fly ash exposure and *any* health condition. Terry Dep., at 188:7-188:17. Dr. Terry testified that the only study he was aware of that addressed airborne exposure to fly ash, or “resuspended particulates” – the primary avenue of exposure at issue – was the study by Ruhl, Vengosh, et al. cited in his report. *Id.* at 179:3-188:10. And Dr. Terry agreed that the authors of that study concluded that there was not sufficient information available to establish that an exposure to fly ash can cause any health problem. *Id.* at 184:8-185:8; 186:5-186:22.

Moreover, Dr. Terry has not otherwise attempted to establish that his analysis of the constituents tends to prove that an exposure to fly ash was capable of causing any injury. In particular, while many of the studies cited address the doses or levels of particular substances that

⁵ A summary of the associations he has identified is found on pages 5 and 6 of his April 30, 2018 Declaration. [*Id.*] As to each constituent, Dr. Terry has applied the Bradford Hill Criteria to the *studies* cited, and has concluded that the substance in question is capable of causing the health condition identified. [See, e.g., Doc. 253-4, at 15 (Report, at 7).]

were found to be associated with the particular conditions at issue [*see* Doc. 253-4, at 20-21, 25, 51], Dr. Terry does not attempt to connect those exposures and the exposures at Kingston. And he cannot make such a connection because, while Dr. Terry has conceded the importance of dosage,⁶ he does not know the minimum levels or doses of fly ash (or even the constituents of fly ash) to which a person would need to be exposed to cause any condition. *Id.* at 114:22-115:25; 117:8-120:18. Similarly, he does not know the levels of any constituent at Kingston and has not attempted to calculate the possible doses of any worker's exposure to any substance. *Id.* at 126:5-134:19. Thus, Dr. Terry does not and cannot address whether the workers' exposures at Kingston were similar in any meaningful way to the exposures identified in *any* of the cited literature.

In sum, Dr. Terry has failed to connect his literature review to the exposures at issue.

3. Dr. Terry does not address biological plausibility as to *fly ash* exposure.

While Dr. Terry has offered opinions addressing biological plausibility as to several "components" found in fly ash, he does not offer any opinion addressing whether it is biologically plausible that an exposure to *fly ash* was capable of causing any type of harm. Critically, Dr. Terry concedes that he cannot offer such an opinion because there is *no* data that suggests that people who are exposed to fly ash are more likely to have the listed conditions than any other group. As Dr. Terry testified in his deposition, and as referenced in his October Disclosure, Dr. Terry planned to address the issue of biological plausibility as to fly ash exposure by comparing the incidence of medical conditions amongst the Plaintiffs with the incidence of such conditions in his control group and in the general population. Terry Dep., at 137:10-139:19; [Doc. 205-06, at 2.⁷] Dr. Terry

⁶ Dr. Terry agrees that the constituents identified in his report occur naturally and are only harmful at certain levels. Terry Dep., at 125:22-126:7 (agreeing that the "dose makes the poison.").

⁷ In his prior report, Dr. Terry opined that "[a]t this point in time, the data suggests that the alleged injuries of the plaintiffs being caused by extended exposure to fly ash is biologically plausible

testified that without such data, it would be impossible to reach any conclusion as to biological plausibility. In particular, he explained that while he also considered other information in reaching his prior opinion as to biological plausibility, “the higher incidence rates are kind of necessary here. Because without it you have nothing to conclude.” Terry Dep., at 138:10-21. He reiterated that “the high incidence rates [are] a necessary component of the conclusion.” *Id.* at 138:22-24.

Thus, because Dr. Terry was unable to complete his study, he does not and cannot offer any opinion regarding biological plausibility as to fly ash exposure.⁸

4. Dr. Terry’s opinions do not establish that many of the constituents at issue were even bioavailable at Kingston, by way of an exposure to fly ash.

The proof in this case is that most of the *constituents* of fly ash identified in Dr. Terry’s report – namely, the heavy metal constituents: arsenic, cadmium, chromium, lead, nickel, and vanadium – were *not* bioavailable at Kingston, *i.e.*, an exposure to fly ash would not have equated to an exposure to those constituents. As the Court has noted, and as reflected in the Tennessee Department of Health Public Health Assessment (“the Public Health Assessment”) and the Material Data Safety Sheet for fly ash (“MSDS”), fly ash particles are stable and the constituents found in fly ash remain bound to the ash particles under most conditions. *See In re TVA Ash Spill Litig.*, 805 F. Supp. 2d at 480; [Docs. 192-11, at xix, 20, 79 (pp. 24, 65, and 124 of 157); 192-12, at 247-48 (pp. 135-36 of 162); 237-13, at 2 (p. 3 of 4)]. Additionally, Jacobs’ expert toxicologist has offered opinions further explaining why that is the case. [Doc. 237-7, at 10, 12, 13 (pp. 14, 16-

because exposed workers have higher occurrence [sic] of several diseases and health conditions compared with the general population and our control group.”

⁸ Dr. Terry also confirmed that his initial findings of higher incidence rates of certain conditions amongst the Plaintiffs are “no longer part of [his] opinion in this case.” *Id.* at 139:15-19.

17 of 90).]. Thus, an exposure to fly ash does *not* equate to an exposure to most of the harmful constituents of fly ash identified in Dr. Terry's report.

Dr. Terry has not offered any opinion addressing the chemical properties of fly ash, let alone explained how such particles at Kingston could have become unstable, either in the environment or after entering the body, thus allowing the constituents to become unbound. [*See id.*] While his report references "bioavailability" in eight instances [*see* Doc. 253-4, at 20, 24, 29, 38, 45, 50, 55, 59], he never actually opines that any heavy metal constituent was or could have become bioavailable at Kingston. For several of the constituents identified, he has failed to address the issue of bioavailability at all,⁹ and in the instances where he does purport to address the issue, the cited studies do not support his conclusions. In particular, none of the articles actually address whether or under what conditions constituents of fly ash become unbound from fly ash particles.

For example, Dr. Terry identifies studies that he claims are relevant to the issue of bioavailability in addressing arsenic and chromium exposure; however, in both instances, the studies cited do not contain any analysis of the issue of bioavailability, and actually address an entirely different issue: the *leaching*¹⁰ of certain contaminants from fly ash into soil. [Doc. 253-4, at 24, 45.] And the EPA report, which appears to be the only article cited that even references the issue at hand, confirms that neither the EPA nor any other agency has concluded that an exposure

⁹ For example, Dr. Terry identifies concentrations of lead and cadmium that were found in fly ash at Kingston, but makes no distinction between exposure to fly ash and an exposure to lead or cadmium, and does not offer any explanation as to how lead or cadmium might have become unbound from the ash particles. [*Id.* at 20, 29, 50.] Dr. Terry does not even purport to offer any opinion addressing bioavailability as to nickel or vanadium. [*See, e.g., id.* at 75-76, 88-89.]

¹⁰ This, of course, is not a groundwater case, and the referenced articles do not, in any event, contain any analysis of the issue of bioavailability relevant to this case.

to fly ash equates to an exposure to its constituents.¹¹ Indeed, the report states that the EPA *did not* attempt to address the issue bioavailability, and expressly notes, with respect to airborne inhalation, that the “bioavailability of constituents” was one of several “uncertainties.” *Id.*¹²

5. Dr. Terry does not explain *how* fly ash particles are capable of causing harm.

The importance of explaining *how* a substance being studied is capable of causing harm is clearly illustrated in Dr. Terry’s report, where he explains his conclusions regarding biological plausibility as to the *constituents* of fly ash. As to each of the substances identified, Dr. Terry has concluded that the studies provide one or more plausible explanations, from a pathophysiological standpoint, as to *how* the substance in question, *once absorbed*, can cause or set into motion a reaction in the human body that results in the medical conditions at issue. [See, e.g., Doc. 253-4, at 15, 27, 30 (Report, at 7, 19, 22).]¹³ Based upon those explanations, he has concluded that it is

¹¹ See <https://www.federalregister.gov/documents/2010/06/21/2010-12286/hazardous-and-solid-waste-management-system-identification-and-listing-of-special-wastes-disposal-of>.

¹² In his deposition, when asked about bioavailability, Dr. Terry referenced these studies, and claimed that he was relying upon “determinations” made by government agencies, particularly the EPA, that regulations are needed to address “concerns of exposure to fly ash.” See *id.*; [Doc. 253-4 (noting that EPA proposed to regulate coal byproducts in order “to address the risks of disposal of [coal byproducts] . . .”).] Based upon the fact that the agencies had recommended regulations pertaining to the disposal of coal byproducts, Dr. Terry claims that, according to the government, an exposure to fly ash is not distinguishable from an exposure to the constituents. See Terry Dep., at 195:22-25 (“consistent with these agencies, it would be difficult for me to separate constituents from the source of the constituents.”). Dr. Terry has clearly misinterpreted the cited reports.

¹³ As to each association he has identified, Dr. Terry has described the pathophysiological explanations supported by the literature. For example, Dr. Terry explains that “[t]he pathophysiology of lead induced hypertension has been examined in several studies, and the association appears to be biologically plausible.” [Doc. 253-4, at 15 (Report, at 7).] Similarly, in addressing cadmium and coronary artery disease, Dr. Terry explains that “[m]ultiple plausible mechanisms have been suggested, including those related to oxidative stress, inflammation, endothelial dysfunction, enhanced lipid synthesis, upregulation of adhesion molecules, prostanoid dysbalance, and altered glycosaminoglycan synthesis.” [*Id.* at 27 (Report, at 19).]

biologically plausible that each substance is capable of causing the conditions identified. [See *id.*] However, Dr. Terry does not offer *any* opinion addressing what happens to *fly ash particles* once they enter the body. Specifically, he has not offered *any* opinion addressing what happens to fly ash particles when they are inhaled, ingested, or otherwise come into contact with the body. In particular, Dr. Terry admitted he does not know what happens to fly ash particles if they make it into the lungs. Terry Dep., at 140:12 to 142:1.

Most notably, Dr. Terry has not offered any opinions explaining how fine particulate matter found in *fly ash* can cause harm. As with the other “components” of fly ash he identifies, Dr. Terry has not offered any opinions addressing the physical or chemical structure of fine particulate matter found in fly ash. Dr. Terry acknowledged that while the capacity of fine particulate matter to cause harm depends upon the shape of the particle,¹⁴ he does not have any knowledge regarding the shape(s) or structure(s) of fine particulates found in fly ash. [*Id.*] Dr. Terry also cannot provide any information regarding the nature or extent of Plaintiffs’ exposure to fine particulate matter at Kingston. Moreover, Dr. Terry has agreed that there is no way to establish the minimum dose of an exposure to fine particulates that that would be necessary to cause any type of harm, and that there is no way to distinguish between the fine particulate matter at Kingston and other dust of a similar size in the atmosphere that every person is exposed to everyday. *Id.* at 129:17-131:6 (agreeing that “[i]t’s not knowable with what we have available to us . . .”).

¹⁴ Dr. Terry testified as follows: “So shape does matter even in -- you know, inert particles that get caught in the lungs. What I don't know is to what extent the shape -- not just the size, like you said, but the shape matters when it comes to particulate matter. So, by analogy, if it does what asbestos does because of a certain shape, or if a certain shape can lead to that kind of interference of mitosis, for example, or can be more irritating, by analogy, I would say it's possible. And I can't tell you any more than that.” Terry Dep. at 144:14-146:9.

B. Other Relevant Evidence In The Record

None of the other evidence in the record suggests, let alone proves, that fly ash exposure is capable of causing any health condition. As previously discussed in these cases, the AOC merely confirms that the ash at the site contains the constituents listed in Dr. Terry's report. [AOC, at 7.]. However, the AOC as well as other sources confirm that fly ash itself is not considered to be a hazardous waste by the EPA. [267-1, at 8; Doc. 292-2, at ES-3 (p. 2 of 4).] Nor does any of the other evidence in the record address the issues of biological plausibility or bioavailability.

RELEVANT LEGAL STANDARDS

Jacobs adopts and incorporates by reference its analyses of the applicable standard for general causation set forth in its Memorandum in Support of Renewed Motion for Partial Summary Judgment on General Causation [Doc. 242, at 13-18], and in its Reply brief [Doc. 263, at 3-9]. To summarize, Plaintiffs must prove that an exposure to fly ash, of the type and nature that *they* experienced, "had the capacity to cause the harm alleged." *Sterling v. Velsicol Chem. Corp.*, 855 F.2d 1188, 1199-1200 (6th Cir. 1988). In order to meet that burden, Plaintiffs must prove: (1) the minimum levels of exposure to constituents of fly ash necessary to cause the types of illnesses they allege; (2) the doses or levels of the constituents to which Plaintiffs were potentially exposed while working at Kingston, *i.e.*, actual exposure to potentially harmful levels of the constituents; and (3) that it is biologically plausible that their exposure could have caused the harm alleged. *See id.*; *Knight v. Kirby Inland Marine Inc.*, 482 F.3d 347, 352 (5th Cir. 2007); *McClain v. Metabolife Intern., Inc.*, 401 F.3d 1233, 1239 (11th Cir. 2005); *In Re Hanford Nuclear Reservation Lit.*, 292 F.3d 1124, 1133 (9th Cir. 2002); *Bonner v. ISP Techs., Inc.*, 259 F.3d 924, 928 (8th Cir. 2001).

ARGUMENT

Plaintiffs have failed to prove that their exposure to fly ash was capable of causing any of the injuries they have alleged. As discussed, there are several substantial gaps in Plaintiffs' proof

that render them unable to establish general causation, even under the standard for general causation that Plaintiffs have asked the Court to apply.¹⁵

Plaintiffs are relying entirely upon Dr. Terry to establish general causation, but his opinions regarding certain *constituents* of fly ash do not establish that an exposure to *fly ash* is capable of causing the injuries alleged. First, as stated and as further discussed in Jacobs' Reply brief, which is again incorporated by reference [Doc. 263, at 14-19], Dr. Terry has failed to identify or conduct any study that establishes that *these Plaintiffs'* exposure to *fly ash* was capable of causing any health issue. And having failed to identify or conduct such a study, Dr. Terry cannot establish any of the essential elements of general causation: (1) the minimum level of exposure to fly ash that can cause harm; (2) the doses to which Plaintiffs might have been exposed, or the durations of their possible exposures; or (3) the extent to which Plaintiffs' exposure to fly ash equated to an exposure to the constituents of fly ash addressed in his report. *See In re TVA Ash Spill Litig*, 805 F. Supp. 2d. at 482; *Knight*, 482 F.3d at 352; *In re Hanford*, 292 F.3d at 1133; *Bonner*, 259 F.3d at 928; *McClain*, 401 F.3d at 1239-42. And there is no other proof that addresses these issues.

Nor does Dr. Terry make any comparison between the Plaintiffs' exposures and the exposures addressed in the studies he has identified. And he cannot do so, because he cannot identify the minimum levels or doses of fly ash exposure that would be sufficient to cause any health condition, and admits he has absolutely no knowledge about the exposures at Kingston.

Moreover, and as explained, *supra*, Dr. Terry does not and cannot establish that it is biologically plausible that an exposure to fly ash could have caused the injuries alleged, for several reasons. First, and most importantly, Dr. Terry has expressly acknowledged that there is no way

¹⁵ As further discussed in the parties' prior briefs, Plaintiffs contend that they must merely prove, without addressing, in any way, the circumstances or dosage of the Plaintiffs' alleged exposure, that fly ash can cause the types of injuries alleged.

for him to reach any conclusion on biological plausibility as to *fly ash* exposure because, absent any reliable data showing a higher incidence of the conditions alleged in a population exposed to fly ash, it is impossible to reach *any* conclusion as to whether it is biologically plausible that an exposure to *fly ash* could have caused such conditions. Terry Dep., at 117:5-117:21; 137:25-139:19. Thus, while Plaintiffs have attempted to avoid this issue entirely by focusing on the *constituents* of fly ash, and Dr. Terry's opinions on biological plausibility relating to those constituents, Dr. Terry's own testimony affirmatively proves that there is no way to establish that it is biologically plausible that the exposures that are actually at issue in this case – exposures to fly ash at Kingston – were capable of causing any of the injuries alleged.

Even if data or studies addressing the incidences of disease amongst people exposed to fly ash were available, Dr. Terry would still not be able to address the issue of biological plausibility as to fly ash exposure, because he cannot explain *how* fly ash particles are capable of causing harm. As stated, Dr. Terry has not offered any opinion addressing what happens to fly ash particles once inhaled or ingested, let alone an explanation, from a pathophysiological standpoint, as to how fly ash particles can cause any particular condition.

In particular, Dr. Terry has failed to address the issue of bioavailability. Again, according to the MSDS for fly ash, TDOH's Public Health Assessment, the On-Scene Coordinator Report, and Jacobs' expert, Dr. Phillips, fly ash particles remain stable under most conditions and, as a result, the constituent elements remain bound to the fly ash particles. [Doc. 192-11, at xix, 20, 79 (pp. 24, 65, and 124 of 157); 192-12, at 247-48 (pp. 135-36 of 162); 237-7, at 10, 12, 13 (pp. 14, 16-17 of 90); Doc. 237-13, at 2 (p. 3 of 4).] Plaintiffs have failed to offer *any* evidence that addresses, let alone refutes, that proof. Indeed, Dr. Terry acknowledged in his deposition that he was aware that fly ash particles generally remain stable under most conditions. Terry Dep., at

139:20-142:1; 189:16-189:18. Against that backdrop, because Plaintiffs contend that the *constituents* found in fly ash caused the harm alleged, they must, therefore, first explain, at least as to the heavy metal constituents: (1) *how* and under what conditions the constituents can become unbound from the ash particles, and (2) whether and to what extent that might have occurred at Kingston. Stated another way, Plaintiffs must, at the very least, prove that the fly ash particles somehow became unstable at Kingston and that, as a result, constituents of fly ash became unbound, and thus bioavailable.

Thus, the evidence in the record is that most of the substances at issue – arsenic, cadmium, chromium, lead, nickel, and vanadium – were *not* bioavailable, *i.e.*, an exposure to fly ash at Kingston would not have equated to an exposure to those constituents. As a result, Dr. Terry’s opinions on biological plausibility as to the constituents of fly ash, which explain only what happens once those substances *have already been absorbed*, do not address whether it is biologically plausible that an exposure to *fly ash* could have caused the injuries alleged.

Dr. Terry also cannot establish biological plausibility as to the remaining substances identified in his report – fine particulate matter and ionizing radiation¹⁶ – for similar reasons. In particular, Dr. Terry’s inability (and failure) to explain what happens to *fly ash particles* when they are inhaled, ingested, or otherwise come into contact with the body has also rendered him unable¹⁷

¹⁶ To the extent Plaintiffs claim that Dr. Terry has also opined that the constituents have a “synergistic” effect, this is speculation and, as Dr. Terry admitted, he considered “one outcome and one exposure” and *not* any such “synergistic” effect. Terry Dep., at 138:25-139:2; 177:2; 177:10-177:12; 184:8-185:16.

¹⁷ As stated, Dr. Terry also lacks any statistical basis for concluding that it is biologically plausible that an exposure to fine particulate exposure or radioactive isotopes in fly ash was capable of causing any health issue. As a result, it is impossible to reach any conclusion as to biological plausibility regarding an exposure to fly ash that contains such “components.”

to establish biological plausibility with respect to fine particulate matter or ionizing radiation.¹⁸ With regard to fine particulate matter, especially, Dr. Terry does not and cannot explain how an exposure to such particles might have caused harm because he lacks any specific knowledge regarding the chemical *or* physical properties of fly ash particles (*e.g.*, the shapes of the particles). [See Doc. 253-4, at 44-46, 73-76, 85-95;] Terry Dep. at 144:14-146:9. Even if he could provide such information, Dr. Terry concedes that there is no way to determine the minimum dose of fine particulate matter necessary to cause harm and, therefore, no way to distinguish between an exposure to fine particulate matter found in fly ash and an exposure to fine particulate matter found elsewhere, for purpose of establishing causation. Similarly, Dr. Terry has not offered any opinion addressing whether or to what extent the radioactive elements bound to fly ash were capable of being absorbed via inhalation or ingestion, or through any other means of exposure. Therefore, as with the heavy metal constituents identified in Dr. Terry's report, Plaintiffs cannot rely upon Dr. Terry's opinions to establish that it is biologically plausible that their alleged injuries were caused by an exposure to fine particulates or ionizing radiation.

In sum, there is no proof in the record that establishes that exposure to fly ash at Kingston was capable of causing Plaintiffs' alleged injuries, let alone proof that Plaintiffs could have received a sufficient dose of fly ash at Kingston to cause any type of harm.

CONCLUSION

For all of these reasons, Jacobs respectfully requests that the Court grant its Renewed Motion for Partial Summary Judgment on General Causation.

¹⁸ Unlike the other "components" addressed in Dr. Terry's report, which are bound up in fly ash particles, "fine particulate matter" refers to the ash particles themselves, namely those "having an aerodynamic diameter of 2.5 μ (microns) or less." [Doc. 253-4, at 30 (Report, at 22).]

Respectfully submitted,

NEAL & HARWELL, PLC

By: /s/ James F. Sanders

James F. Sanders No. 005267

jsanders@nealharwell.com

J. Isaac Sanders No. 029372

isanders@nealharwell.com

Marie T. Scott No. 032771

mscott@nealharwell.com

1201 Demonbreun Street, Suite 1000

Nashville, Tennessee 37203

Telephone: (615) 244-1713

Facsimile: (615) 726-0573

- and -

SMITH CASHION & ORR, PLC

Jefferson C. Orr (No. 12743)

jorr@smithcashion.com

S. Joe Welborn (No. 21747)

jwelborn@smithcashion.com

Joshua K. Chesser (No. 27993)

jchesser@smithcashion.com

231 Third Avenue North

Nashville, Tennessee 37201

Telephone: (615) 742-8555

Facsimile: (615) 742-8556

Attorneys for Defendant

Jacobs Engineering Group, Inc.

CERTIFICATE OF SERVICE

I hereby certify that on this the 4th day of September, 2018, I have electronically filed the foregoing document with the Clerk of the Court using the CM/ECF system. Notice of this filing will be sent to all parties and counsel of record by operation of the Court's CM/ECF system. All other parties will be served by regular U.S. Mail. Parties may access this filing through the Court's electronic filing system.

/s/ James F. Sanders